

Claims

[30020678 US]

1. A method for generating wander noise according to a predefined frequency profile, the method comprising the steps of:
  - 5 selecting one of a plurality of predefined frequency profiles;
  - providing predetermined frequency, amplitude and phase values for each of a plurality of tones for the selected predefined frequency profile;
  - generating a digital noise signal based on the sum of the plurality of tones; and
- 10 generating a wander noise signal from the digital noise signal.
2. A method according to claim 1, further comprising the step of adding a centre frequency signal to the digital noise signal before the wander noise signal is generated.
- 15 3. A method according to claim 1, wherein the predetermined frequency values for each of the plurality of tones are determined by the steps of:
  - defining a required frequency profile;
  - determining a frequency range for the required frequency profile, the required frequency range having upper and lower frequency limits;
  - 20 determining the plurality of tones required to provide a desired tone density in the determined frequency range; and
  - determining frequency values for each of the plurality of tones.
- 25 4. A method according to claim 3, wherein the step of determining frequency values for each of the plurality of tones comprises the step of:
  - determining a suitable tone spacing between the upper and lower frequency limits.
- 30 5. A method according to claim 3, wherein the predetermined amplitude values for each of the plurality of tones are determined by the step of:
  - iteratively determining an amplitude value for each of the plurality of tones to produce a desired fit to the required frequency profile.

6. A method according to claim 3, wherein the predetermined phase values are determined by the steps of:

applying a phase value for each of the plurality of tones;

generating a digital noise signal based on the sum of the plurality of 5 tones; and

repeating the steps of applying a phase value and generating a digital noise signal until the digital noise signal produces a desired fit to the required frequency profile, whereby the phase values that produce the digital noise signal that produces a desired fit to the required frequency profile are used as the 10 predetermined phase values.

7. A method according to claim 6, wherein the desired fit of the digital noise signal to the required frequency profile is determined by determining the skewness and kurtosis values for the plurality of tones and comparing the

15 skewness and kurtosis values to predetermined desired skewness and kurtosis values.

8. A method according to claim 1, wherein the predetermined frequency, amplitude and phase values are associated with the corresponding predefined 20 frequency profile and stored in a memory.

9. Apparatus for generating wander noise according to a predefined frequency profile, the apparatus comprising:

25 a memory for storing predetermined frequency, amplitude and phase values for each of a plurality of tones for each of a plurality of predefined frequency profiles;

a digital signal processor coupled to the memory for obtaining the predetermined frequency, amplitude and phase values for the plurality of tones for a selected one of the plurality of predefined profiles and for generating a 30 digital noise signal based on a sum of the plurality of tones; and

a synthesizer coupled to the digital signal processor for receiving the digital noise signal and for generating a wander noise signal from the digital noise signal.

10. Apparatus according to claim 9, wherein the digital signal processor further includes means for adding a centre frequency signal to the digital noise signal.

5    11. Apparatus according to either claim 9, including means for predetermining the frequency values for each of the plurality of tones for a required frequency profile by determining a frequency range for the required frequency profile, the required frequency range having upper and lower frequency limits, determining the plurality of tones required to provide a desired  
10 tone density in the determined frequency range, and determining frequency values for each of the plurality of tones.

12. Apparatus according to claim 11, wherein said means for predetermining the frequency values determines a suitable tone spacing between the upper and  
15 lower frequency limits to produce the predetermined frequency values for each of the plurality of tones.

13. Apparatus according to claim 11, including means for predetermining the amplitude values for the plurality of tones by iteratively determining an amplitude  
20 value for each of the plurality of tones to produce a desired fit to the required frequency profile.

14. Apparatus according to claim 11, including means for predetermining the phase values for the plurality of tones by applying a phase value for each of the plurality of tones, generating a digital noise signal based on the sum of the plurality of tones, repeating the steps of applying a phase value and generating a digital noise signal until the digital noise signal produces a desired fit to the required frequency profile, whereby the phase values that produce the digital noise signal that produces a desired fit to the required frequency profile are  
30 used as the predetermined phase values.

15. Apparatus according to claim 14, wherein the means for predetermining the phase values includes means for determining the skewness and kurtosis

values for the plurality of tones and comparing the skewness and kurtosis values to predetermined desired skewness and kurtosis values.